

HTTP

Hypertext Transport Protocol

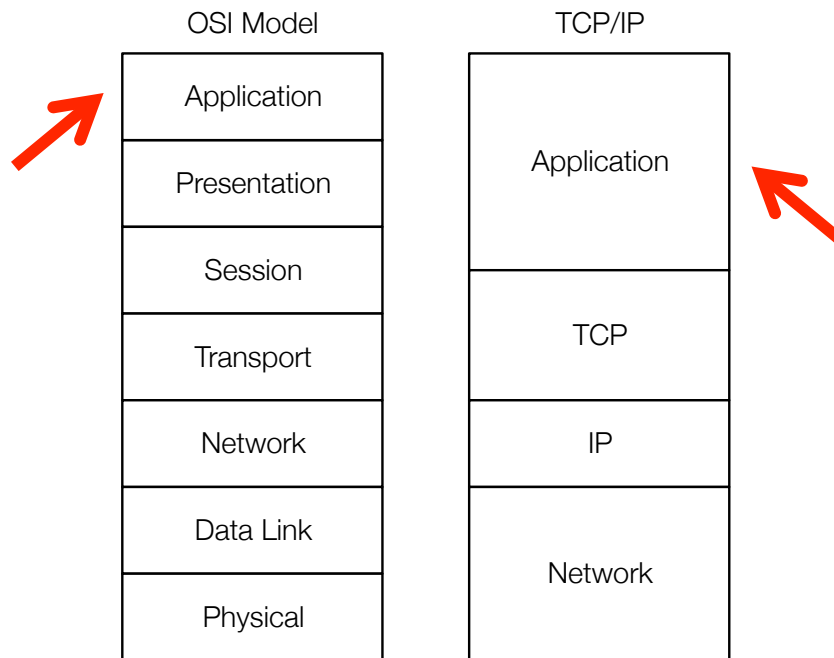


Terminology

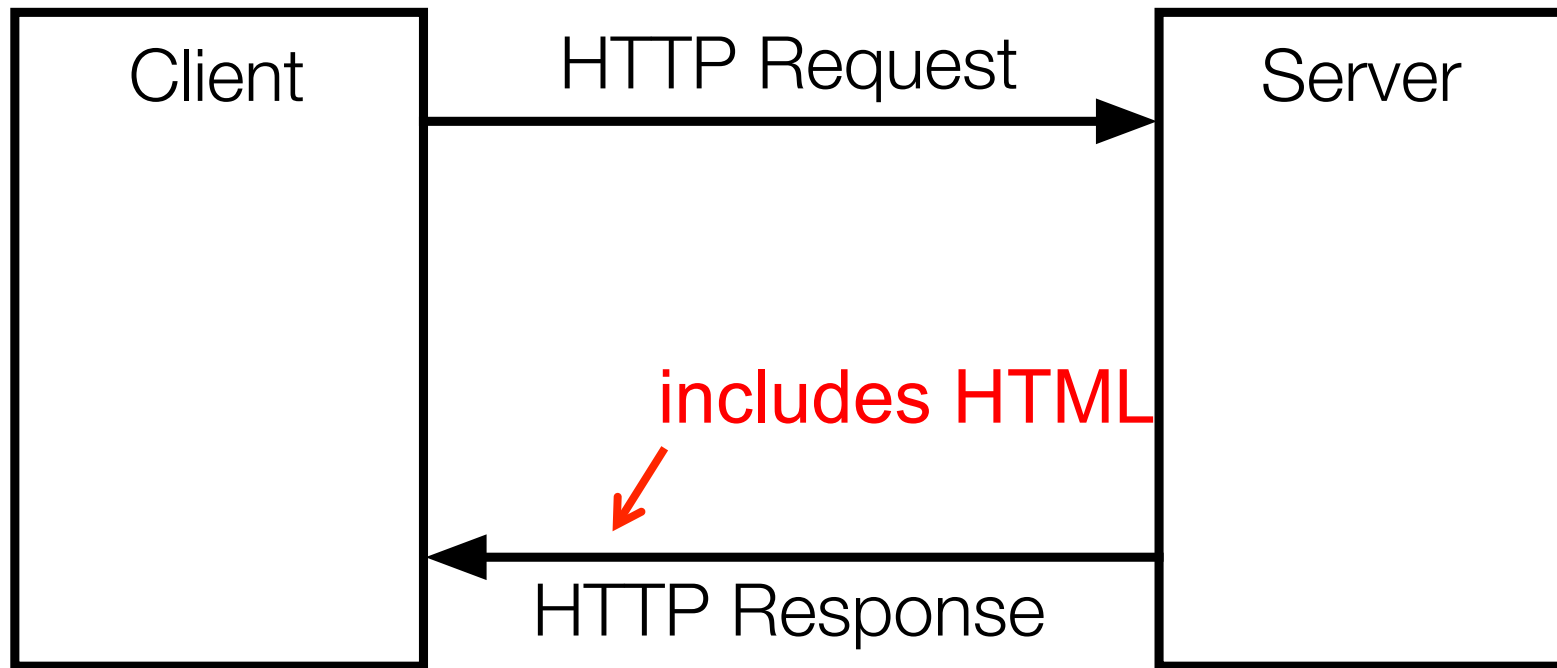
- Uniform Resource Locator (URL)
 - Used to identify webpages and other resources
- Hypertext Transport Protocol (HTTP)
 - Used to transfer webpages from server to browser
- Hypertext Markup Language (HTML)
 - Used to create webpages, parsed by browser



Application-Level Protocol



Client/Server Architecture

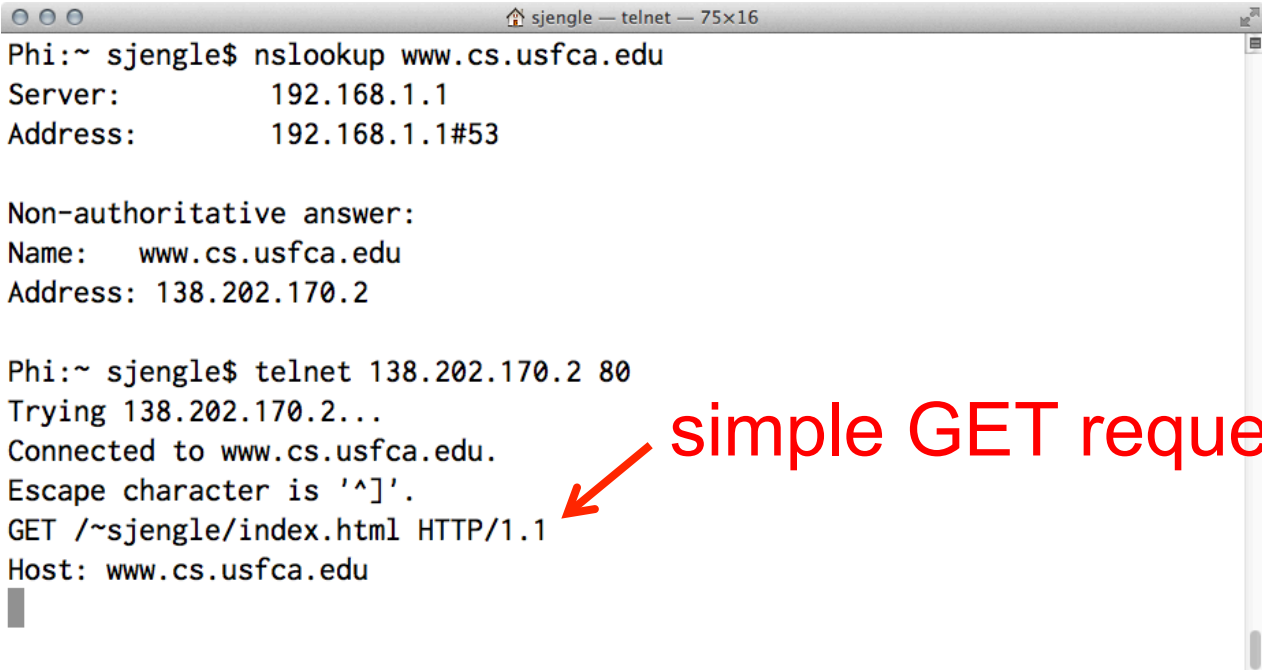


HTTP Requests

- Versions
 - HTTP/1.1 Specification
<http://www.w3.org/Protocols/rfc2616/rfc2616.html>
 - HTTP/1.0 Specification
<http://www.w3.org/Protocols/rfc1945/rfc1945.txt>
- Request Types
 - GET: Requests or “gets” a resource
 - POST: Submits or “posts” a resource



HTTP/1.1 GET Request



```
sjengle — telnet — 75x16
Phi:~ sjengle$ nslookup www.cs.usfca.edu
Server:      192.168.1.1
Address:     192.168.1.1#53

Non-authoritative answer:
Name:   www.cs.usfca.edu
Address: 138.202.170.2

Phi:~ sjengle$ telnet 138.202.170.2 80
Trying 138.202.170.2...
Connected to www.cs.usfca.edu.
Escape character is '^]'.
GET /~sjengle/index.html HTTP/1.1
Host: www.cs.usfca.edu
```

simple GET request



HTTP/1.1 GET Response



```
sjengle — bash — 75x16
GET /~sjengle/index.html HTTP/1.1
Host: www.cs.usfca.edu

HTTP/1.1 200 OK
Date: Wed, 04 Apr 2012 03:39:15 GMT
Server: Apache/2.2.3 (CentOS)
Accept-Ranges: bytes
Content-Length: 3697
Connection: close
Content-Type: text/html; charset=UTF-8

<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01//EN" "http://www.w3.org/TR/html4/strict.dtd">

<html>
```



HTTP/1.1 GET Response



```
sjengle — bash — 75x16
GET /~sjengle/index.html HTTP/1.1
Host: www.cs.usfca.edu

HTTP/1.1 200 OK
Date: Wed, 04 Apr 2012 03:39:15 GMT
Server: Apache/2.2.3 (CentOS)
Accept-Ranges: bytes
Content-Length: 3697
Connection: close
Content-Type: text/html; charset=UTF-8


<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01//EN" "http://www.w3.org/TR/html4/strict.dtd">

<html>
```

returned HTML



HTTP/1.1 HEAD Request



```
sjingle — bash — 75x16
Phi:~ sjingle$ telnet 138.202.170.2 80
Trying 138.202.170.2...
Connected to www.cs.usfca.edu.
Escape character is '^]'.
HEAD /~sjingle/index.html HTTP/1.1
Host: www.cs.usfca.edu

HTTP/1.1 200 OK
Date: Wed, 04 Apr 2012 03:44:34 GMT
Server: Apache/2.2.3 (CentOS)
Accept-Ranges: bytes
Content-Length: 3697
Connection: close
Content-Type: text/html; charset=UTF-8

Connection closed by foreign host.
```

Response Code 200



HTTP/1.1 Response Codes



```
Phi:~ sjengle$ telnet 138.202.170.2 80
Trying 138.202.170.2...
Connected to www.cs.usfca.edu.
Escape character is '^]'.
HEAD ~/sjengle/index.html HTTP/1.1

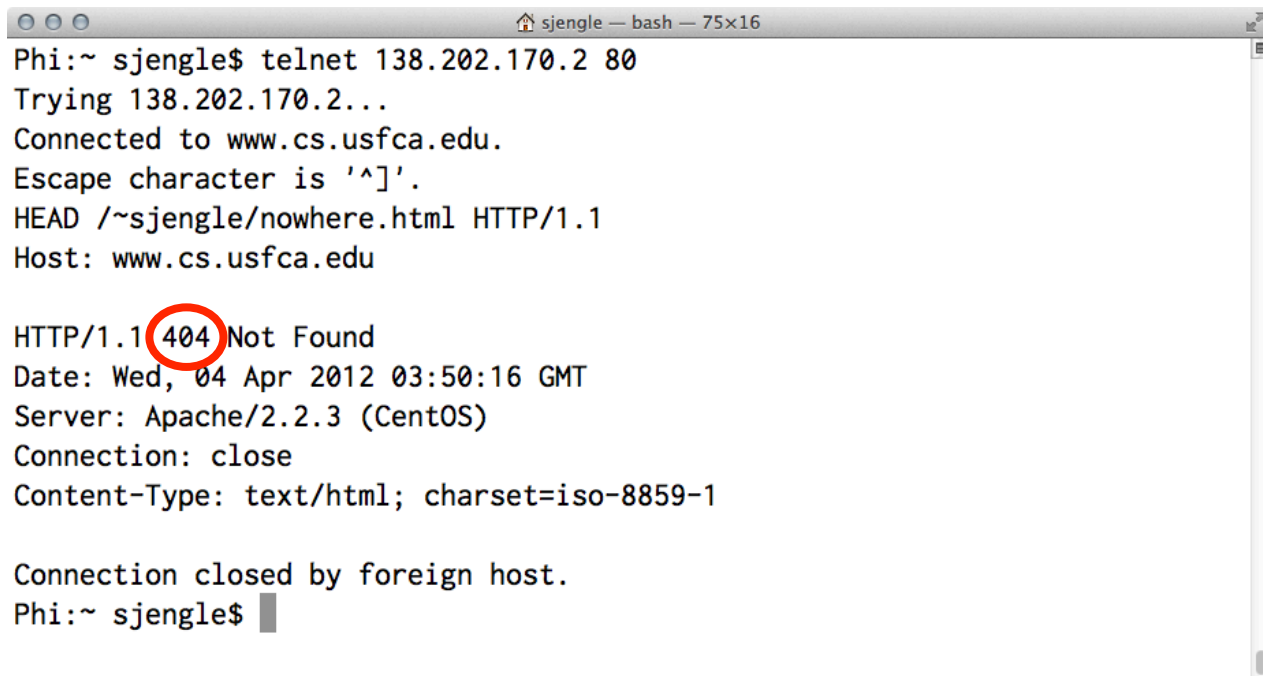
HTTP/1.1 400 Bad Request
Date: Wed, 04 Apr 2012 04:42:23 GMT
Server: Apache/2.2.3 (CentOS)
Connection: close
Content-Type: text/html; charset=iso-8859-1

Connection closed by foreign host.
Phi:~ sjengle$
```

Response Code 400



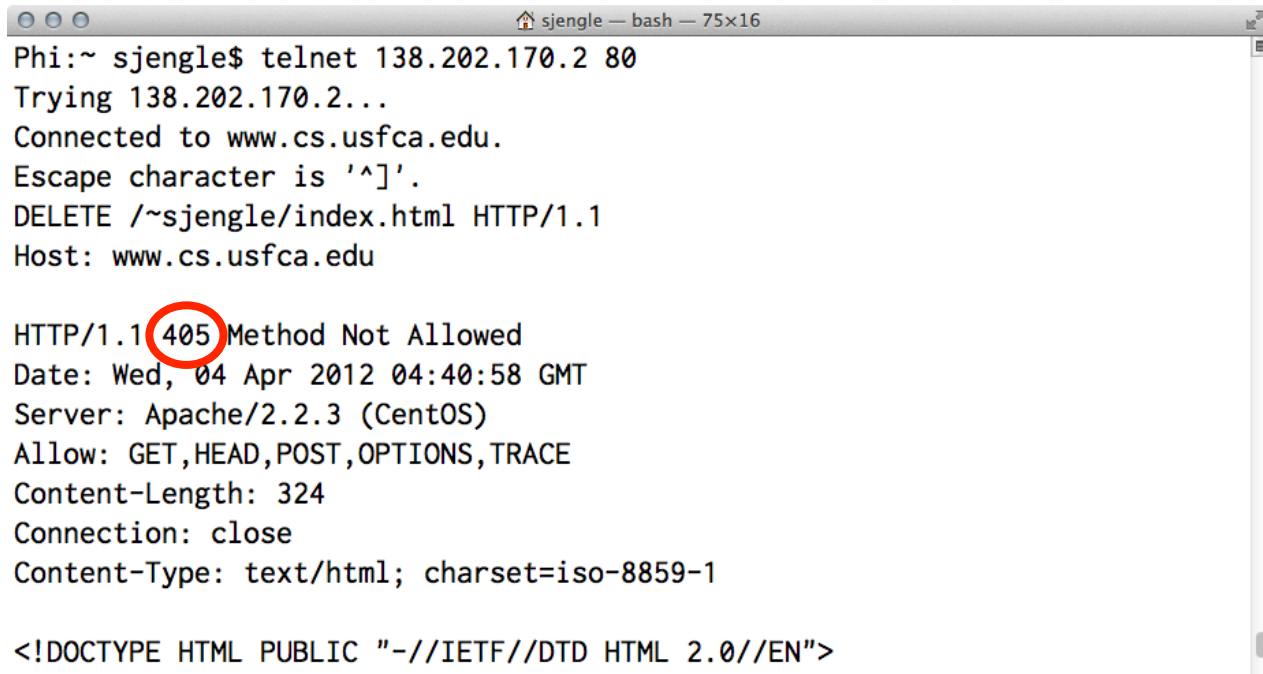
HTTP/1.1 Response Codes

A terminal window titled 'sjengle — bash — 75x16' showing a telnet session. The user enters 'telnet 138.202.170.2 80', and the terminal shows the connection process. The user then enters 'HEAD /~sjengle/nowhere.html HTTP/1.1', and the terminal displays the response: 'HTTP/1.1 404 Not Found'. The '404' is circled in red. The response also includes 'Date: Wed, 04 Apr 2012 03:50:16 GMT', 'Server: Apache/2.2.3 (CentOS)', 'Connection: close', and 'Content-Type: text/html; charset=iso-8859-1'. The session ends with 'Connection closed by foreign host.' and the prompt 'Phi:~ sjengle\$'.

Response Code 404



HTTP/1.1 Response Codes

A terminal window titled 'sjengle — bash — 75x16' showing a telnet session. The user enters 'telnet 138.202.170.2 80', and the terminal shows the connection process and the receipt of an HTTP 405 response. The response text is: 'HTTP/1.1 405 Method Not Allowed', 'Date: Wed, 04 Apr 2012 04:40:58 GMT', 'Server: Apache/2.2.3 (CentOS)', 'Allow: GET,HEAD,POST,OPTIONS,TRACE', 'Content-Length: 324', 'Connection: close', 'Content-Type: text/html; charset=iso-8859-1', and '<!DOCTYPE HTML PUBLIC "-//IETF//DTD HTML 2.0//EN">'. The '405' in the status line is circled in red.

```
Phi:~ sjengle$ telnet 138.202.170.2 80
Trying 138.202.170.2...
Connected to www.cs.usfca.edu.
Escape character is '^]'.
DELETE /~sjengle/index.html HTTP/1.1
Host: www.cs.usfca.edu


HTTP/1.1 405 Method Not Allowed
Date: Wed, 04 Apr 2012 04:40:58 GMT
Server: Apache/2.2.3 (CentOS)
Allow: GET,HEAD,POST,OPTIONS,TRACE
Content-Length: 324
Connection: close
Content-Type: text/html; charset=iso-8859-1

<!DOCTYPE HTML PUBLIC "-//IETF//DTD HTML 2.0//EN">
```

Response Code 405



HTTP/1.1 OPTIONS Request



```
sjingle — bash — 75x16
Phi:~ sjingle$ telnet 138.202.170.2 80
Trying 138.202.170.2...
Connected to www.cs.usfca.edu.
Escape character is '^]'.
OPTIONS /~sjingle/index.html HTTP/1.1
Host: www.cs.usfca.edu

HTTP/1.1 200 OK
Date: Wed, 04 Apr 2012 04:44:23 GMT
Server: Apache/2.2.3 (CentOS)
Allow: GET,HEAD,POST,OPTIONS,TRACE
Content-Length: 0
Connection: close
Content-Type: text/html; charset=UTF-8

Connection closed by foreign host.
```

allowed operations

An orange arrow points from the text "allowed operations" to the "Allow" header in the response, which lists the permitted HTTP methods: GET, HEAD, POST, OPTIONS, and TRACE.



Submitting Data

- GET Method
 - Encodes data in URL as query string
(e.g. <http://www.google.com/search?q=usfca>)
 - Good for getting or retrieving specific data
- POST Method
 - Encodes data in request message body
 - Good for posting data to be stored on server





CHANGE THE WORLD FROM HERE